
TOM FIORE, University of Michigan-Dearborn

Waldhausen Additivity and Approximation in Quasicategorical K -Theory

Waldhausen Additivity, in its general form, says that Waldhausen K -theory sends a split-exact sequence

$$\mathcal{A} \rightarrow \mathcal{E} \rightarrow \mathcal{B}$$

to a stable equivalence

$$K(\mathcal{E}) \rightarrow K(\mathcal{A}) \vee K(\mathcal{B})$$

of spectra. I will sketch a proof for the case that \mathcal{A} , \mathcal{E} , and \mathcal{B} are Waldhausen quasicategories satisfying mild hypotheses. The method here is to prove the classical theorem in an entirely simplicial way, combining elements of previous proofs, and then carry this proof over to quasicategories. Weak adjunctions between quasicategories and between simplicial categories are also needed. This is joint work with Wolfgang Lück. I will mention the related work by Barwick and Blumberg–Gepner–Tabuada.

Additionally, I will discuss my recent work on a Waldhausen-style Approximation Theorem in quasicategorical K -theory: if an exact functor induces an equivalence of cofibration homotopy categories, then it induces a stable equivalence of K -theory spectra. A corollary is that any exact functor which induces an equivalence of homotopy categories and reflects cofibrations induces a stable equivalence of K -theory spectra. The class of cofibrations, for both Approximation and Additivity, is general.